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(54) 非発光素子ディスプレイの集光装置

明細書

2. 図面の簡単な説明

第 1 図は、従来の非発光素子ディスプレイのバックライト方式による一使用例の構成を示した分解斜視図。

第 2 図は、従来の非発光素子ディスプレイのバックライト方式による他の使用例の構成を示した分解斜視図。

例 2 の 図

第 3 図は、本考案による非発光素子ディスプレイ集光装置の結合状態を示した図面。

図面の主要部分に対する符号の説明

10;ディスプレイパネル

60;導光板

62;集光機

第 3 図は本考案による非発光素子ディスプレイ集光装置の結合状態を示した図面であり、示された通り、ディスプレイパネル(10)外部に導光板(60)が一定面積突出しており、上記突出部分の上面には集光機(62)が付着されている。

上記の状態でディスプレイパネル(10)外部に突出している導光板(60)上段に付着された集光機(62)は外部の光源を吸収して導光板(60)に伝達し、上記導光板(60)は集光機(62)から吸収した光をディスプレイパネル(10)に間接伝達するようになる。従って、既存バックライト方式の電源による光発散でない外部の光源を利用するので、別途の電源が必要でなく、ノートブックコンピュータなどのような電池を電源に使用する携帯用機器の使用時間をより延長でき、バックライト自体と上記バックライトを点灯させるインバータから発生する熱と騒音を解決してより高画質の画像が得られる。

上述した通り、本考案は非発光素子ディスプレイに使用されるバックライトの代わりに導光板に集光機を付着して外部光源を使用することによって、バックライトが自体的に消費する電力を排除し、バックライト自体とバックライト点灯に必要なインバータから騒音及び熱が発生することによるディスプレイの画質に及ぼす悪影響と、上記バックライトとインバータの使用によって部品費の上昇などを防止することができる効果の考案である。

SPECIFICATION

1. Title of the Invention

LIGHT CONDENSING APPARATUS FOR NON-EMISSIVE-DEVICE
DISPLAY APPARATUS

2. Brief Description of the Drawings

Fig. 1 is an exploded perspective view of a construction of an example of a conventional backlight-type, non-emissive-device display apparatus.

Fig. 2 is an exploded perspective view of a construction of another example of a conventional backlight-type, non-emissive-device display apparatus.

Fig. 3 is a view illustrating an arrangement of a light condensing apparatus for a non-emissive-device display apparatus according to the present utility model.

[Reference Numerals]

10: display panel

60: light guide plate

62: light condenser

3. Detailed Description of the Invention

[Technical Field of the Utility Model]

The present utility model relates to a non-emissive-device display apparatus, and more particularly to a light condensing apparatus for a non-emissive-device display apparatus in which a light condenser is attached to a light guide plate to utilize an external light source instead of a backlight, which has been used for the non-emissive-device display apparatus.

[Description of the Related Art]

In general, in case of a display apparatus using a non-emissive-device, since the non-emissive-device cannot emit light, the light, which is projected from a light source such as backlight, is modulated and displayed as an external image. Two examples of the backlight-type of the non-emissive display apparatus are illustrated in Figs. 1 and 2.

As shown in Fig. 1, the backlight-type, non-emissive-device display apparatus comprises a display panel 1, a diffusing plate 2 which is placed below the display panel 1 to diffuse light, a backlight 3a which is placed below the diffusing plate 2 to emit light, a reflecting plate 4 which is placed below the backlight 3a to reflect the light illuminated by the backlight 3a, and an inverter 5 which is placed below and connected to the backlight 3a to turn the backlight 3a on and off.

In addition, in another example shown in Fig. 2, the backlight-type of the non-emissive-device display apparatus comprises a display panel 1, a light guide plate 6 which is placed below the display panel 1 to indirectly transmit light, a backlight 3b which is placed at a side plane of the light guide plate 6, and an inverter 5 which is placed below and connected to the backlight 3b.

In the constructions of both examples, since the non-emissive-device display apparatus cannot emit light, the backlight 3a needs to be placed below the display panel 1. The light emitted from the backlight 3a is transmitted through the side plane of the light guide plate 6 or the lower plane of the diffusing plate 2 to the display panel 1.

However, since most of the non-emissive-device display apparatuses are used for a portable apparatus having a high-density small display screen, power consumption of the backlight 3a in the conventional backlight-type, non-emissive-display apparatus may impose a heavy burden on its user, and noise and heat generated from the backlight itself and the inverter 5 which turns the backlight 3a on and off has an adverse effect on the image quality of the display apparatus. In addition, usage of the backlight 3a and the inverter 5 has been a factor of the rise in the cost of the parts.

[Means for Solving the Problems]

The present utility model is contrived to solve the aforementioned problems. The object of the present utility model is to provide a light condensing apparatus for a non-emissive-device display apparatus in which a light condenser is attached to a light guide plate to utilize an external light source instead of a backlight, which has been used for the non-emissive-device display apparatus.

The object of the present utility model is achieved by a light condensing apparatus for a non-emissive-device display apparatus comprising: a light guide plate being externally protruded from the non emissive device display; and a light condenser for condensing light from an external light source, wherein the light condenser is placed on a protruded plane of the light guide plate.

In other words, instead of using light emitted from the backlight, which is power-consumptive, the light guide plate to which the light condenser is attached, is externally protruded from the display panel to utilize the external light source instead of the power source.

[Description of the Embodiments]

Now, the present utility model will be described in detail with reference to the accompanying drawings.

Fig. 3 is a view illustrating an arrangement of a light condensing apparatus for a non-emissive-device display apparatus according to the present utility model. As shown in Fig. 3, a certain area of a light guide plate 60 is externally protruded from the display panel 60 and a condenser 62 is attached to the top plane of the protruded portion.

In such a construction, the light condenser 62 which is attached to the top plane of the light guide plate 60 externally protruded from the display panel 10, absorbs light from an external light source and transmits the light to the light guide plate 60. The light guide

plate 60 indirectly transmits the light, which is absorbed from the light condenser 62, to the display panel 10. Accordingly, since external light source is used rather than light emitted from power source in the conventional backlight-type, no additional power source is necessary, and thus, the durability for such portable apparatus as a notebook computer, which uses battery as a power source, can be prolonged. Moreover, the problems of noise and heat generated from the backlight itself and the inverter, used for turns the backlight on and off can be solved, so that it is possible to obtain higher image quality.

As described above, since the present utility model utilizes an external light source condensed by the light condenser attached to the light guide plate instead of the backlight used for the non-emissive-display apparatus, it is advantageous that the power consumption of the backlight itself can be removed, and adverse effects derived from the noise and heat of the backlight itself and the inverter, used for turning the backlight on and off, and the high-cost that incurs from using the backlight and the inverter, can be avoided.

4. Claims

1. A light condensing apparatus for a non-emissive-device display apparatus comprising:

a light guide plate being externally protruded from the non-emissive-device display;

and

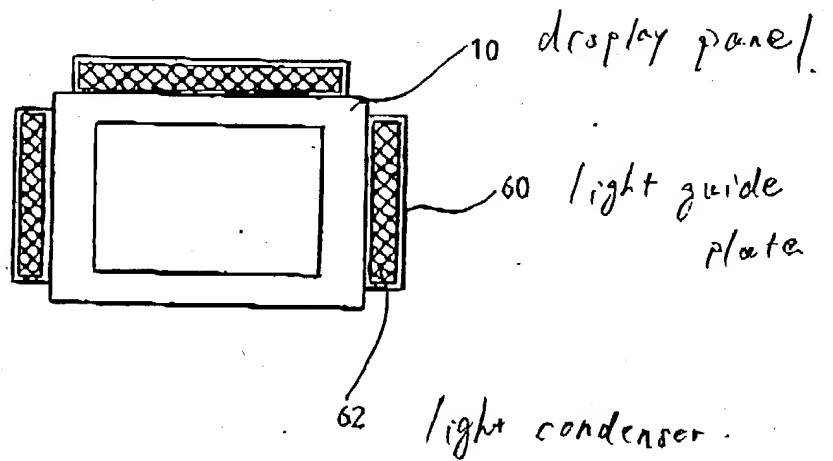
a light condenser for condensing light from an external light source,

wherein the light condenser is placed on a protruded plane of the light guide plate.

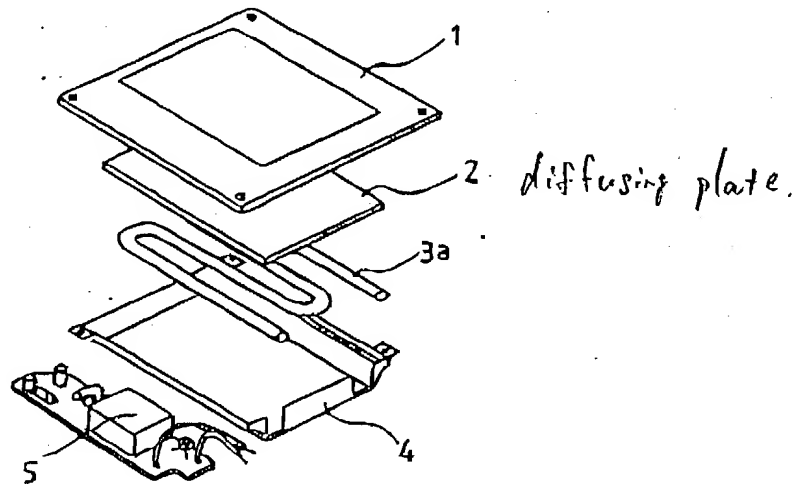
ABSTRACT

The present utility model relates to a non-emissive-device display apparatus, and the object of the present utility model is to provide a light condensing apparatus for a non-emissive-device display apparatus in which a light condenser is attached to a light guide plate to utilize an external light source instead of a backlight which has been used for the non-emissive-device display apparatus. In the construction of the present utility model, the light guide plate 60 is externally protruded from the non-emissive-device display apparatus, and the light condenser 62 for condensing the external light source is placed on the protruded plane of the light guide plate 50. According to the construction of the light condensing apparatus for the non-emissive-display apparatus, since the external light source condensed by the light condenser attached to the light guide plate is used instead of the backlight which has been used for a conventional non-emissive-display apparatus, it is advantageous that the power consumption of the backlight itself can be removed. In addition, it is advantageous that adverse effects derived from noise and heat of the backlight itself and the inverter, used for the backlight turn on and off, and the high-cost that incurs from using the backlights and the inverter, can be avoided.

(Fig 3)



< fig 1 >



< fig 2 >

